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HIGH - PRC

Duration of Closures

Evaluation Criteria - Duration of all long term closure of lane(s) on mainline, ramps, cross streets, and other roads, as detailed on Form F

Edit	Facts						
	KGA:						
	Based on Form F Part 2 (Full Closures), PRC has committed to a maximum cummulative total of 2,220 days of full closures (50% of Allowable Closures) throughout the project including the following:						
	 Interchange Cross-Streets Full Closures: Total - 240 (80% of Allowed); 						
	O High - 0,						
	O Medium - 240,						
	O Low-0						
	 Ramps Full Closures: Total - 1,130 (37% of Allowed); 						
	O High - 30,						
	O Medium - 280,						
	O Low - 820						
	 Non-interchange Cross-Streets Full Closures: Total - 850 (77% of Allowed); 						
	○ High - 0,						
	O Medium - 400,						
	O Low - 450						
	Based on Form F Part 1 (Partial Closures), PRC has committed to a maximum total of 13,509 days of partial closures throughout the project including the following:						
	Mainline Partial Closures: Total of 11,134						

• Interchange Cross-Streets Partial Closures: Total of 775:

• Non-interchange Cross-Streets Partial Closures: Total of 120;

• Intersection Movements Partial Closures: Total of 840

Edit Significant Strengths

consensus:

PRC is using 1130 of the 3030 (37.3%) allowable ramp long term full closure days. This includes no ramp long term full closures at multiple Provo Center and Spanish Fork Main Street interchange ramps, and reduced durations at ALL others. There are also no closures at ramps with a "High" designation (based on traffic volume). This is an aggressive approach to maintaining ramp access and will enhance drivers' ability to utilize the extra lane (over requirements) that PRC is maintaining for much of their construction schedule.

The long term partial closures that PRC proposes to mainline is greatly reduced from what is allowed and demonstrates an effort to maximize capacity on I-15. This will encourage freeway trips to stay on the freeway.

PRC greatly minimizes the impact due to long term partial closures to ramps. No individual ramp will be long term partially closed for more than 6 months, and most for a maximum of 40 days. This "get in and get out" approach helps minimize inconvenience.

Minor Strengths

PRC is using 850 of the 1100 (76.6%) allowable Non-Interchange Cross Street long term full closure days. All NICSs have a reduced long term full closure duration over allowable except Spanish Fork 2700 N, Lindon 200 S, and Sam White Lane. Minimizing impact to these NICSs helps maintain connectivity across I-15 and reduces the demand for the crossing movement at the higher volume Interchange Cross Streets.

No long term full closure is proposed at Provo Center Street (all other Interchange Cross Street long term full closures meet requirements). This is significant because Provo Center Street provides direct access to and from downtown Provo.

PRC proposes minimal (25 days) long term partial Interchange Cross Street closure to University Parkway.

closure to University Parkway.

Minor Weaknesses Significant Weaknesses

Consensus:

PRC proposes 8 months of partial Interchange Cross Street closure to Provo Center Street.

Regional Mobility

O High - 25, O Medium - 750, O Low - 0

High - 220,Medium - 260,Low - 160

High - 0,Medium - 120,

• Ramps Partial Closures: Total of 640;

Evaluation Criteria – Quality of both AM and PM peak hour regional mobility based on long term closures or openings of mainline lanes, in each major MOT phase, over the life of the Project. Regional mobility is defined as the impact of construction activities on the following measures of effectiveness from the Paramics models:

- o Number of vehicles blocked from entering the model.
- o Travel times between select origins and destinations.
- o Confirmation that the Paramics models are representative of the scheduled major long term closures and openings of mainline lanes.

Edit	Facts	0	Edit Significant Strengths	Minor Strengths	Minor Weaknesses	Significant Weaknesses
	LAP		Consensus:	***************************************	Consensus:	
	[From required regional mobility narrative]:		PRC maintains 3 lanes in each direction in phases 1 and 2 of Traffic Pattern 2, with the exception of the area between the on and off ramps at Provo Center in phase 1 where 2 lanes are maintained.	Consensus: The extra lanes maintained on mainline by PRC enhance the ability	The PM Peak models of Configurations 4 and 10 where PRC has I-15 in a -1 configuration show congestion on the arterial network in Provo.	

- Acknowledged I-15 north-south functionality and interaction with parallel routes and arterials.
- Performed additional capacity assessments (beyond minimum number of lanes open) to determine advantages of keeping additional lane open.
- Selected models based on paving sequencing and MOT areas in the corridor.
- Maintaining 4 GP lanes each direction North of University Parkway and 3 GP lanes each direction South of University Parkway, with two exceptions: 2 lanes NB and SB through Provo Center for duration of construction, and 2 lanes NB through University Avenue in first phase.
- Converting express lane to GP lane in first configuration.
- Other configurations include crossovers and lane reductions associated with paving operations.
- Travel time runs for comparison of scenarios only considered the I-15 Southbound PM peak period.
- Comparison of travel times indicate MOT plan reduces travel time on I-15 versus the existing or minimum conditions.
- I-15 operating at free flow speed in PM SB.
- Reduction in traffic diversion to parallel arterials when compared to minimum RFP requirement.

REB [MOT Paramics Model Review] edited by JKS

 PRC violated a modeling requirement by adjusting vehicle release rates for 3 PM scenarios (configurations 9-11). Making these modifications invalidates the calibration of the models, and was specifically not allowed. There was no explanation provided. These three coding violations were not included in any of the other 19 models (AM and PM) submitted by PRC.

PRC changed release loading rates at some zones (222,130,226,332 and 333) in Configurations 9-11 PM peak models. This change violates directions in the Instructions on the Applicatio of models. This resulted in a very high level of blocking, allowing fewer trips into the model, causing significant increases in travel times as the project is completed. The result of the above violation is less than adequate assessment of operations in the University Avenue area.

- Entered lane choices incorrectly into the both peak hour models
 representing Configurations 9 & 10 on SB 1-15 at Lehi Main Street. The
 resultant model operations do not match intended operations. Resultant
 travel times are increased to the north, and reduced to the south.
- The PRC proposal was much better than documentation the MOT review team received with the models. The documentation received with the models was very poor.
- All Paramics model configurations matched the proposal except for configuration 9 in the PM peak. This model had three lanes in each direction from University Parkway to Pleasant Grove when it should have had four.
- Local road capacity improvements identified in the proposal were not incorporated into their models.
- Proposal indicates responsive traffic signals will be added; this will benefit regional mobility during and after construction. (Not represented in model.)
- Removing the HOV lane to gain general purpose capacity offsets the impact of construction. Besides items noted above, travel times are consistent to pre-construction levels.
- The NB lane reduction through Provo Center St. has little to no impact on operations.
- operations.

 9. I-15 SB final proposal configuration relieves congestion in the PM peak, based on 2008 volumes used for MOT evaluation.
- 10. Significant blocked vehicles were observed in many model runs including:
 - Configuration 4 21k and 27k
 - Configuration 7 15kConfiguration 9 33k
 - Configuration 10 12k, 13k, 17k, 20k, 26k and 27k, (Average of 19k for configuration)
- 11. NB Spanish Fork to Orem City Center has a 15 minute increase in travel
- Downtown Provo, Univ Ave, Univ Pkwy area, experiences considerable congestion during Configuration 10. Blocked vehicles are high.
- Journey travel time summary (not total regional travel but selected O-D movements, ~3% of total movements) indicates additional 2,700 minutes of travel time during PM peak hour through project completion in December of 2014 (9,300 minutes through December of 2012, PRC's end of construction). There is

This capacity enhances travel times on I-15 during construction, which are relatively equal to existing conditions.

PRC maintains 4 lanes in each direction in both phases of construction of Traffic Pattern 1 (University Parkway to Lehi), except for during 180 days in Phase 1 and 90 days in Phase 2 for paving operations. This capacity enhances travel times on I-15 during construction, which are relatively equal to existing conditions.

Journey travel time summary (not total regional travel but selected O-D movements, ~3% of total movements) indicates additional 9,300 minutes of travel time during PM peak hour through project completion (12/2012). However, reduction (295,000 trips) in trip making due to congestion would inflate the low increase in travel time. The PM Peak in most phases of PRC's MOT plan are accommodated to an exceptional level. [Note: this data is based on mainline lane closures only, and does not account for closure of ramps and cross streets.]

to manage incidents and provides additional capacity to serve peaks in demand.

In Configurations 4 and 10 of the proposal it is expected that operations in the University Avenue area (from University Avenue Interchange north through downtown Provo to University Parkway) will be impacted, as indicated by a large number of blocked vehicles. Blocked vehicles are an indication that the model was not able to serve the demand during the peak hour, and is associated with congestion.

Significant Weaknesses

a 5.6% reduction through December of 2014, which represents 307,000 trips, which would inflate the low increase in travel time (trip reduction is 295,000 through December of 2012).

MEDIUM - PRC Phasing Plan Evaluation Criteria - Phasing plan logic and complexity

Edit Fact

Traffic Pattern 3 South of Provo Center Street to Spanish Fork

- Phase 0
- 2 GP lanes in each direction from SF river to US-6
- 3 GP lanes in each direction from US-6 to SR-77 SB Off Ramp
- 3 GP Lanes in the NB direction from SR-77 to End of Segment 2C (600 S Provo)
- 3 GP Lanes in the SB direction and 1 Aux lane from SR-77 to SR-75 On Ramp and then drop the Aux Lane. Pick up the Aux Lane at SR-75 Off Ramp to 1860 West On ramp. Continue with 3GP lane to the End of Segment 2C (600 S Provo)
 Phase 1
- 3GP lanes SB between Provo Center and US-6
- 3 GP lanes NB between Provo Center and University Ave.
- 1 GP lane exists at University Ave. Exist only Lane
- 2 GP lanes NB between gore points at University Ave
- 1 Gp lane NB added from the on ramp at University Ave
- 3 Gp lanes NB between University Ave and US-6
- 2 GP Lanes between US-6 SB off Ramp and South end of the project.
- Maintain 1 lane off and on ramp SB at SR-77 through phased constuction
- Maintain 1 lane off and on ramp SB at SR-75 through phased constuction
- Shift traffic to SB at US-6 and Spanish Fork Main Street Interchanges where 2GP in both directions will be maintained
- Phase 2
- Traffic will shift to the new pavement on SB lanes
- 3GP lanes in both direction between Provo Center and US-6
- 2 GP lanes between US- 6 and the south end of the project
- At US-6 and Spanish Fork interchanges traffic will shift to the new pavement NB lane and maintain 2 GP lanes in both directions

Traffic Pattern 2 Provo Center Street to South of University Parkway • Phase 0

- 3 GP Lanes NB from 600 S Provo to the end of segment 2B (north of Univeristy prkwy)
- 3 GP Lanes SB from 600 S Provo to Provo Center Street
- 2 GP lanes SB from Provo Center Street to Station 2175+00 and add 1 GP to the end of segment 2B (north of Univisity prkwy)
- Short term closures on cross streets
- Phase 1
- 3GP lanes SB between provo center off Ramp to and University Parkway
- 2 GP lanes in both direction Provo Center Street off Ramp to Provo Center Street NB on Ramp
- 3 GP Lane NB Provo Center Street on ramp to University Parkway
- All traffic will be shifted to SB Lanes
- I-15 center street Provo 2 GP lanes in each direction
- Maintain 3 lane each direction at university parkway and sandhill rd
- Maintain 2 lanes on NB off ramp university parkway through phased construction
- reduce provo center street to 1 lane each direction
- 2 temp signals
- Phase 2
- All traffic will be switched to the NB new pavement section
- 3GP lanes in each direction
- Maintain SB on ramp 1 lane through phased constuction

Traffic Pattern 1 South of University Parkway to State Street Lehi

- Phase 0
- Traffic will be configured to the outside lanes in areas where overpass bridges are being constructed.
- Lanes shifts at areas where overpasses are being constructed

Edit Significant Strengths

consensus:

PRC's phasing minimizes closures (both Full and Partial) to onand off-ramps. This is a logical approach to ramp access in that it allows traffic to make the best use of the added (over requirements) capacity on mainline I-15. Minor Strengths

Consensus:

Construction through the Provo S-curves is staged to maintain 3-lanes in each direction in Phases 1 and 2.

Minor Weaknesses

Consensus:

PRC provided very little detail regarding the relative phasing of construction. All of the project is delivered in two segments, and phasing is provided that shows how construction will occur at each discrete location, but sufficient information was not provided to show relative impacts of phasing and the delivery of completed segments. This prevents a true assessment of the logic of PRC's approach to delivering the project.

The lack of description of the relative phasing of construction on mainline and at interchanges implies that construction may be present for the entire duration of both major phases of construction. This has a negative impact on capacity.

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- 3GP and 1 HOV lanes NB from North of University Parkway to station 3180+00. At 3180+00 4GP lanes to 3218+00/4150+00 at which point it goes back to 3 GP and 1 HOV to Proctor Lane where you go back to 4 GP lanes to PG Blvd where they go back to 3 GP and 1 HOV to the end of Segment 2A.
- 3GP and 1 HOV lanes SB from North of University Parkway to 1200 North. At 1200 North HOV iane goes away for about 2000 feet and then picks back up at 1600 North to station 3180+00. At 3180+00 4GP lanes to 3218+00/4150+00 at which point it goes back to 3 GP and 1 HOV to Proctor Lane where you go back to 4 GP lanes to PG Blvd where they go back to 3 GP and 1 HOV to the end of Segment 2A.
- 3 GP lanes and 1 HOV lane NB to sam white road at which point it goes to 4 GP lanes until the end of segment 1
- 3 GP lanes and 1 HOV lane SB to Sam White rd at which point it goes to 4 GP lanes until the end of segmeth 1
- Construction of temp pavements and center bridge piers during this phase
- 1 lane each direction on 500 E American Fork
- Phase 1
- · Mainline traffic will be shifted to the insde lanes
- 4 GP lanes form University Parkway to the north end of the project in both
- During mainline paving 3 GP lanes north to the end of the project in both directions.
- No traffic lanes shown on ramps at lehi main street.
- Short term full clousre I-15 at 500 E AF to move in to place the SB Bridge
- shift traffic to new SB bridge 500 E AF
- · Proctor lane bridge is constructed
- Close I-15 during off peak periods to place Porctor lane bridge
- Close I-15 durning off peak periods to place Sam White Lane bridge
- Demolish the existing Sam White bridge (I-15 is not addressed to be closed for demo)
- Demolish the existing proctor lane bridge. (I-15 is not addressed to be closed for demo)
- Close Proctor iane while road is realigned for 30 days
- Closing 1600 N Orem and Ramps 60 day
- Ciosing 800 N Orem and Ramps 60 day
- . Closing Orem Center Street and Ramps 60 days
- Phase 2
- Mainline traffice will be shifted to the new pavement on the outside lanes
- 4 GP lanes form University Parkway to the north end of the project in both directions.
- During mainline paving 3 GP lanes north to the end of the project in both directions.
- All ramps at AF 500 E closed for 60 days
- AF 500 E closed for 60 days
- Short term full closure of I-15 at 500 E to place NB bridge
- Interchanges and ramps at 1600 N, 800 N, Orem Center street will be closed
- 3.2.1.2.2 Lehi Main street is listed as a Major interchange under I-15 and in Phase to on page 3.2-15 PRC state the intrechange and ramps will close. Form F doesn't allow for Lehi Main street to close.

LOW - PRC

Evaluation Criteria - Detour plan concept logic and complexity

Edit Significant Strengths Minor Strengths

Consensus:

With few exception, all of the detour routes follow a locigal path and in most cases are the shortest routes.

Minor Weaknesses

Using local roads for detour routes creates a 3rd party risk by requiring additional permitting outside of the project control. This will also limit the abilty to directly coordinate and change signal systems.

Using 1860 South to State Street for the Provo Center Street detour increases the length of the detour, while using University Ave would be shorter and utilize state routes.

Using two detour routes for the same closure of the ramps at Provo Center Street will be confusing to the user. A single route will increase the liklihood of drivers navigating the detour route using the detour signing.

Detour Plan

Improvements on Geneva Road/Center Street

o Add a double right turn form WB center to NB Geneva

o Double left form SB Geneva to EB Center

o Signai will be adjusted according to the new turn configuration

Improvements on State Street/500 East

o Add traffic capacity by re-striping and adjusting signal timing for through traffic

• Improvements on State Street/ PG

o Adding traffic capacity by re-striping and adjusting signal timing for through traffic on state street

Lehi Main Street detour

o Two detour routes may be confusing

Significant Weaknesses

o 850 East should be an alt route o State Street is a better detour o Lehi Main Street is not allowed to be close so why have a detour plan? PG Bivd detour route o PG Bivd not allowed to be closed why have a detour plan? • 200 S. Lindon detour route o Why use 400 west o Take traffic from 1600 N to Geneva Road o Geneva Road may be under construction may need to re-access o Two detour routes are confusing o Duration 180 days No detour route for Proctor Lane • 800 No detour makes sense o Geneva road may be under construction may need to re access o Duration 60 days Orem Center Street detour makes sense o Geneva Road may be under construction o Duration 60 days Provo Center Street o University Ave is a shorter detour than 1860 to State o Extremely long detour o Detour duration Form F shows 0 days closed University Ave detour route o Two detours are confusing to the public o 1860 to university is the shortest route o University is not allowed to be closed so why have a detour? • 1600 North SR-75 o 1600 North is not allowed to be closed why have a detour? • 2700 North detour route o Duration 180 days o Detour makes sense Spanish Fork Main Street o Spanish Fork Main Street is not allowed to be closed o Ramps are closed for 15 days o Detour for ramp closures make sense No Detour plans for o 1750 No SF o 920 S Provo o 600 S Provo o 820 N Provo o 2000 N Provo o 400 S Orem o 400 N Orem o Geneva Road o Sam White Lane o 100 E AF o 200/300 W AF

No detour routes submitted for 1750 No SF, 920 S Provo, 600 S, Provo, 820 N Provo, 2000N Provo, 400 S Orem, 400 N Orem, Geneva Road, 100 E AF, 200/300 W AF making impossible to evaluate the detour.

TMP

Evaluation Criteria - Completeness of Draft TMP in providing commitments and direction regarding:

- o Process to produce MOT Plans, including the following phases of a MOT plan: development (meeting contract requirements), implementation, monitoring, refinement, and maintenance
- o Strategies to maximize, monitor, and maintain regional mobility.
- o Strategies to maintain access to residences and local businesses.
- o Strategies to incorporate temporary and/or permanent ATMS facilities into traffic management during construction, including interface with TOC personnel and software.

Edit Significant Strengths

Edit Facts RJC: Development 1. Establish an MOT Task Force 2. Input from cities, emergency services 3. MOT Manager, TCM resp for development 4. Design team members assigned to Task Force 5. Meet requirements of RFP Implementation 1. TCM resp for implementation 2. QA/QC staff inspects/approves field installation 3. MOT Task Force identifies improvements

Monitoring

- 1. TCM & QA/QC staff monitor on daily basis
- 2. Ensure proper function and setup
- 3. Monitoring queue lengths / traffic flows

4. Feedback from local jurisdictions

Consensus:

The process to produce and refine MOT plans incorporates UDOT and stakeholders

Implementing the Sensys arterial travel time system, providing arterial VMS to communicate those travel times, and enhancing the CommuterLink website to display arterial travel times adds effective tools to collect and disseminate real-time arterial traffic conditions to the public. This accomplishes three things:

- 1. The public has an increasing expectation for real-time traveler information. These tools will help meet that expectation.
- 2. Drivers already within the system can use the travel time info from the VMS and from 511 to make routing decisions while en-route.
- 3. Providing the information on the CommuterLink website will help manage traffic demand as drivers can make informed decisions regarding the timing and routing of

Minor Strengths

Minor Weaknesses Significant Weaknesses

Refinement

- 1. Traffic flow Issues elevated to MOT Manager
- 2. Safety issues addressed immediately
- 3. Refinements made with input from Task Force
- 4. Lessons learned applied to future MOT plans

Maintenance

- 1. TCM resp for maintenance
- 2. Schedule for regular maintenance
- 3. Deficiencies corrected within 12 hrs

Strategies to:

Maximize, monitor and maintain regional mobility

(see 3.2.4.3):

- 1. Maximizing available lanes on I-15
- a. additional lane open for majority of construction
- 2. Monitoring traffic
- a. Utilize existing ATMS as much as possible
- b. Add temporary ATMS (incl full CCTV coverage of lanes in work zones)
- c. Bring new features online asap
- d. Use of i2
- e. Use of temporary CCTV and Hotspot trailers
- f. Sensys arterial travel time system
- g. Maintenance of communication to all devices
- 3. Communication with traveling public
- a. Clear messaging through fixed and variable signing
- b. Use of existing, new and temp ATMS, incl HAR
- c. Sensys arterial travel time
- d. Notification to emergency services, motor carrier
- e. Coordination with CORE PI team
- f. Detour and traffic info to local and long haul trucking
- 4. Signal timing and traffic signal operations
- 5. Innovative ATMS
- a. Sensys arterial travel time system
- b. Arterial VMS for travel times
- c. Signal integration (State St in Pleasant Grove and on Geneva Rd)
- d. Enhanced CommuterLink website (arterial TT, HAR & sign interface)
- e. Ramp metering during construction
- f. CCTV coverage expanded to "critical intersections" (not specific)
- 6. Improvements to parallel and connecting routes (see 3.2.1.4)
- a. Geneva/Provo Center: widen east leg to add WB dbl rt, inc thru capacity
- b. State/500 E: restripe for additional thru capacity on State
- c. State/PG Blvd: restripe for additional thru capacity on State
- 7. Management of Incidents
- a. Courtesy Service Patrol: a truck/driver 24/7 to assist stranded motorists
- i. Details of CSP to be worked out in MOT Task Force (not specific)

Maintain access to residences and businesses

- 1. Create an access plan for each stakeholder along the corridor
- 2. MOT TF ensures access is reflected in MOT plans
- 3. Coord with transit and school bussing
- 4. Monthly report of proposed and implemented actions
- 5. QA/QC inspection of access

Incorporate ATMS Into traffic management during construction (see elements above)

Establishing fiber connections to signals not currently connected to the TOC on State Street (in Pleasant Grove) and Geneva Road (in Pleasant Grove) will enable comprehensive management of state arterials along the corridors.

PRC will provide full CCTV coverage of all travel lanes within the work zones (page 3.2-51). This is a significant advantage for TOC operators and emergency services in managing incidents on the freeway.

Brings new ATMS features on-line early in the schedule, to maximize the benefit of traveler information to and from the TOC.

median travel times and volumes. This will be a useful tool to measure regional mobility during construction.

QA personnel will inspect business and residential accesses on at least a weekly basis.

QA/QC staff will monitor field setups daily, in addition to the TCM.

PRC will coordinate with transit providers and the agencies that provide school bussing in the development of MOT plans to ensure they have input and to communicate upcoming closures effecting their routes. They will be invited to participate in the MOT TF.